

ABSTRACT OF THE DISCLOSURE

The present invention relates to a new method for radiolabeling chemical compounds. The new method attains the goals of simplicity, high radiochemical yields, speed, versatility, and automation. An HPLC injection loop on an HPLC injection valve is loaded with a solution of precursor and the radiolabeling reagent is passed through the loop. The contents of the loop are then quantitatively injected onto the HPLC column for purification. Radiochemical yields are equal to or superior to conventional solution methods in all cases, even though no heat need be applied. Since no vials, transfer lines, cooling, heating, or sealing valves are required, no transfer losses occur, yields are high, and clean-up is minimal. This "loop method" is ideal for the preparation of radiolabeled compounds, in particular those prepared from [^{11}C]-iodomethane.